

# Walking behaviour and glycemic control in type 2 diabetes: Seasonal and gender differences--Study design and methods

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#### Abstract:

BACKGROUND: The high glucose levels typically occurring among adults with type 2 diabetes contribute to blood vessel injury and complications such as blindness, kidney failure, heart disease, and stroke. Higher physical activity levels are associated with improved glycemic control, as measured by hemoglobin A1C. A 1% absolute increase in A1C is associated with an 18% increased risk for heart disease or stroke. Among Canadians with type 2 diabetes, we postulate that declines in walking associated with colder temperatures and inclement weather may contribute to annual post-winter increases in A1C levels. METHODS: During this prospective cohort study being conducted in Montreal, Quebec, Canada, 100 men and 100 women with type 2 diabetes will undergo four assessments (once per season) over a one-year period of observation. These assessments include (1) use of a pedometer with a concealed viewing window for a two-week period to measure walking (2) a study centre visit during which venous blood is sampled for A1C, anthropometrics are assessed, and questionnaires are completed for measurement of other factors that may influence walking and/or A1C (e.g. food frequency, depressive symptomology, medications). The relationship between spring-fall A1C difference and winter-summer difference in steps/day will be examined through multivariate linear regression models adjusted for possible confounding. Interpretation of findings by researchers in conjunction with potential knowledge "users" (e.g. health professionals, patient groups) will guide knowledge translation efforts. DISCUSSION: Although we cannot alter weather patterns to favour active lifestyles, we can design treatment strategies that take seasonal and weather-related variations into account. For example, demonstration of seasonal variation of A1C levels among Canadian men and women with T2D and greater understanding of its determinants could lead to (1) targeting physical activity levels to remain at or exceed peak values achieved during more favourable weather conditions. Strategies may include shifting to indoor activities or adapting to less favourable conditions (e.g. appropriate outdoor garments, more frequent but shorter duration periods of activity) (2) increasing dose/number of glucose-lowering medications during the winter and reducing these during the summer, in anticipation of seasonal variations (3) examining the impact of bright light therapy on activity and A1C among T2D patients with an increase in depressive symptomology when sunlight hours decline.

Source: http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1783642

#### **Resource Description**

#### Communication: M

resource focus on research or methods on how to communicate or frame issues on climate change;

### Climate Change and Human Health Literature Portal

surveys of attitudes, knowledge, beliefs about climate change

A focus of content

Communication Audience: M

audience to whom the resource is directed

Health Professional

Exposure: M

weather or climate related pathway by which climate change affects health

Temperature

Temperature: Extreme Heat

Geographic Feature: **☑** 

resource focuses on specific type of geography

None or Unspecified

Geographic Location:

resource focuses on specific location

Non-United States

Non-United States: Non-U.S. North America

Health Co-Benefit/Co-Harm (Adaption/Mitigation): 

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specification of beneficial or harmful impacts to health resulting from efforts to reduce or cope with greenhouse gases

A focus of content

Health Impact: M

specification of health effect or disease related to climate change exposure

Diabetes/Obesity, Other Health Impact

Other Health Impact: Decreased physical activity levels

Intervention: M

strategy to prepare for or reduce the impact of climate change on health

A focus of content

Mitigation/Adaptation: **№** 

mitigation or adaptation strategy is a focus of resource

Adaptation

Population of Concern: A focus of content

Other Vulnerable Population: Adults with type 2 diabetes

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# Resource Type:

format or standard characteristic of resource

Research Article

#### Timescale: M

time period studied

Time Scale Unspecified

## Vulnerability/Impact Assessment: №

resource focus on process of identifying, quantifying, and prioritizing vulnerabilities in a system

A focus of content